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3-1 TARGET Connector J1, J2 Signal Descrip
3-2 Logic Analyzer Connector J3 Signal Desc
3-3 Logic Analyzer Connector J4 Signal Desc

M68EML

EMULATOR

USER'S M

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Only one of the three sock
any one time. Damage to
MCU is installed.

The RC24EM requires the follow
components of a development sys

- An 80-lead target cable anc
system to connectors J1 an
- One or two 100-KΩ logic a
HP01650-63203), to conne

Table 1-1 lists RC24EM specifica

Table 1-1. M68EML9

Characteristic
MCU extension I/O ports
Operating temperature
Storage temperature
Relative humidity
Power requirements
Dimensions
Weight

CHAP

INTROD

This user's manual explains conn
specific to the M68EML908RC24
makes possible emulation and deb
MC68HC908RC24 microcontroll
emulator, operating in the range 1

The RC24EM can be part of two
those systems and explains the lay

1.1 DEVELOPMENT SYSTEMS

Your RC24EM can be part of two
Motorola Modular Development S
Evaluation System (MMEVS).

1.1.1 Motorola Modular Development Syste

The MMDS0508 is an emulator sy
time memory windows. The unit's
editor, an assembler, user interfac
MMDS0508 consists of:

- **a station module** — the m
control board and the intern
- **an emulator module (EM**
purchased printed circuit bo
specific set of MCUs.
- **two logic clip cable assem**
station module to your targ
any other circuitry useful fo
assembly has a molded con
pod B. Leads at the other e
Ball clips come with the ca
- **a 9-lead RS-232 serial cab**
to the host computer RS-23

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- **a 9- to 25-pin adapter** — a
pin cable to a 25-pin serial
- **system software** — softwa
- **MMDS0508 documentati**
software manual, and the a

You select the MMDS0508 baud

As mentioned, your RC24EM giv
systems based on MC68HC908R
can enable your MMDS0508 to e
(Your Motorola representative ca

1.1.2 M68MMEVS Evaluation System (M

An MMEVS is an economical, tw
evaluating target systems based o
consists of:

- **a platform board (PFB)** –
module. The platform boar
or host computer.
- **an emulator module (EM**
purchased printed circuit b
specific set of MCUs. The
- **an RS-232 serial cable** —
PFB to the host computer F
- **system software** — softwa
- **MMEVS documentation**
(MMEVSOM/D) and the a

An MMEVS features automatic s
4800, 9600, 19200, 38400, or 576

With an RC24EM, your MMEVS
MC68HC908RC24 MCUs. By su
MMEVS to emulate target system
representative can explain all the

Chapter 2 explains how to config
MMDS0508 or MMEVS system.

1.2 EM LAYOUT

Figure 1-1 shows the layout of the

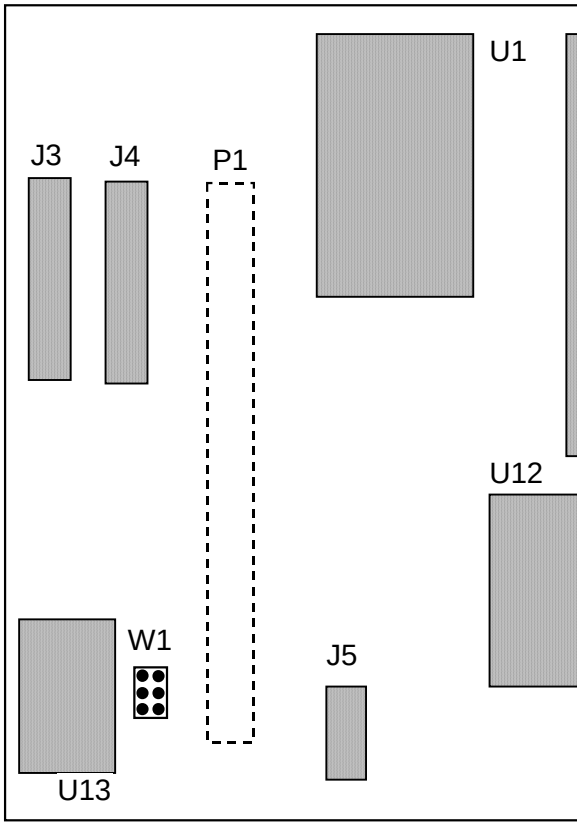

Figure 1-1. M68EML908

Jumper header W1 selects the MC

Jumper header W2 selects the refe
either is adjusted with R26, or can

Test point E1 and variable resistor
adjustment of the VMCU voltage,

Connectors J1 and J2 are the custo
Connectors J3 and J4 permit conn
only for factory test.

The resident MC68HC908RC24 M
U5 or U2, or in the Clamshell soc

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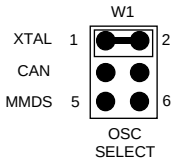
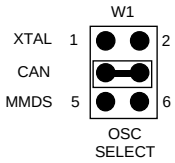
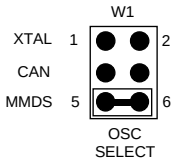
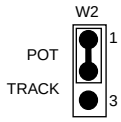
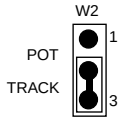
Table 2-1. Ju

Header	Position
Clock Source Select, W1	
	
	
MCU Voltage Reference Select, W2	
	

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CHAP

CONFIGURATION

This chapter explains how to conf
MMDS or an MMEVS. For other
the MMDS or MMEVS hardware

Note that you can configure an RC
station module. To do so, switch o
guidance of this chapter. Similarly
installed on the MMEVS platform
board power.

Be sure to switch off or di
installed EM. Reconfiguri
on can damage system circ

2.1 SETTING JUMPER HEADERS

Your RC24EM has two jumper he
Table 2-1 is a summary of setting
2.1.1 through 2.1.3 give additiona
switch.

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2.2 REMAINING SYSTEM INSTALL

When you have configured all jun
complete RC24EM installation:

- To install the RC24EM in a
half of the station-module e
(on the bottom of the board
the corners of the EM onto
- To install the RC24EM on
connectors P1 and P2 (on th
connectors P3 and P4. Sna
standoffs.
- Copy the personality files f
your debugging software.

At this point, you are ready to ma
power. For instructions, consult th

2.3 SUBSTITUTING MICROCONTR

The factory ships the RC24EM w
of the sockets U1, U2, or U12. To
follow these steps:

1. Turn off or disconnect MM
2. Pull the socket lever to the
or unlock the latch on the
3. Orient the new MCU so th
diagram (and as marked o
4. Push the socket lever back
(U1 or U2), or close the la
5. This completes MCU repl

2.1.1 Setting the External Clock Source Hea

Jumper header W1 selects the sou
below shows the factory configura
4 selects the 8.000 MHz canned o

Fabricate
jumper

Alternatively, you may select two

- To select a user-supplied cr
between pins 5 and 6. (Add
Y1, resistors at locations R
C3. For specifications and
Chapter 4.)
- To select the clock signal fr
platform board), reposition
Then use your system softw

Only one jumper should b
Inserting multiple jumpers
EM24.

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2.1.2 Setting the VMCU control source (W2)

Jumper header W2 selects the sou
MCU voltage. The diagram belov
fabricated jumper between pins 1
R26 as the reference source. See

POT

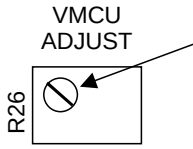
TRACK

Alternately, you may elect to use
MCU voltage. To select the user
reposition the W2 fabricated jump

If you select the target trac
target system on, before y
target system off and on a
MMDS system. If you fai
emulator board might go i
operate correctly. In orde
necessary to turn power to

2.1.3 Adjusting VMCU (E1, R26)

Test point E1 and variable resisto
through 3.6 volts. The diagram be



To adjust VMCU:

1. Make sure that no target c
2. Connect a voltmeter to the
and VMCU (E1-1). (Do n
3. Turn the resistor adjustme
appropriate level.
4. Disconnect the voltmeter.

Make sure that the target s
VMCU level before you c
J2.

If you adjust the VMCU le
the MCU on the emulator
mode and will not operate
operation it is necessary to
then turn power to the MM

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Table 3-1. TARGET Connecto

Pin	Mnemonic	
J1-1, J1-2, J1-19, J1-38, J1-40, J2-9, J2-14, J2-27, J2-32, J2-40	GND	EM GR
J1-21	BATT	Battery
J1-13, J1-14, J2-15, J2-16, J1-15, J1-16, J2-17, J2-18	PTA0 — PTA7	PORT A by softv
J1-35, J1-36, J2-35, J2-36, J1-33, J1-34, J2-33, J2-34	PTB0 — PTB7	PORT B by softv
J2-5, J2-6, J1-5, J1-6	PTC0 — PTC3	PORT C by softv
J2-7, J2-8, J1-7, J1-8	PTC4 — PTC7	PORT C by softv **NOTE**:
J2-25	IRQ1*	INTERR request
J2-23	IRO	IRO —
J1-23	RST*	RESET the MC
J1-27	VMCU	EM MC
J1-30	VCC	MMDS
J2-22	V12	MMDS
J1-20	FATCLK	FAT clo

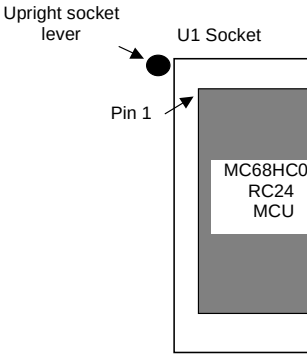

Figure 2-2. M68

Only one of the three sock
any one time. Damage to
applied with more than on

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CHAP

CONNECTOR I

This chapter consists of pin assign
Target and logic analyzer connect

3.1 TARGET CONNECTORS (J1, J2)

Your RC24EM has two Target co
connector. Figure 3-1 and Table 3
descriptions for these connectors.

J1

GND	1	• •	2	GND
	3	• •	4	GND
PTC2	5	• •	6	PTC3
PTC6	7	• •	8	PTC7
	9	• •	10	
	11	• •	12	
PTA0	13	• •	14	PTA1
PTA4	15	• •	16	PTA5
	17	• •	18	
GND	19	• •	20	FATCLK
BATT	21	• •	22	
RST*	23	• •	24	GND
	25	• •	26	
VMCU	27	• •	28	
	29	• •	30	VCC
	31	• •	32	
PTB4	33	• •	34	PTB5
PTB0	35	• •	36	PTB1
	37	• •	38	GND
	39	• •	40	GND

Figure 3-1. TARGET

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3.2 LOGIC ANALYZER CONNECTO

Your RC24EM has two logic anal
connector. Figure 3-3 shows the p
and 3-3 give the signal description

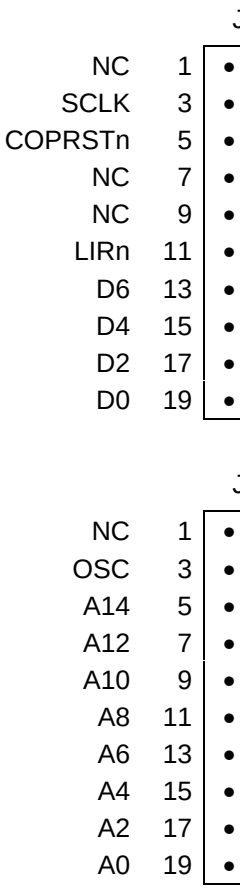

Figure 3-2. Logic Analy

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Table 3-2. Logic Analyzer Co

Pin	Mnemonic	
1, 2, 6 — 9	NC	No connection
3	SCLK	T12 CLOCK — Clo
4	LBOX	LAST BUS CYCLE instruction.
5	COPRSTn	RESET — Active-l
10	R/W	READ/WRITE — S writing.
11	LIRn	LOAD INSTRUCTI an opcode fetch is
12 — 19	D7 — D0	DATA (bits 7—0) –
20	GND	GROUND

Table 3-3. Logic Analyzer Co

Pin	Mnemonic	
1 — 2	NC	No connection
3	OSC	OSCILLATOR — M
4 — 19	A15 — A0	ADDRESS BUS (b
20	GND	GROUND

3.3 TARGET CABLE ASSEMBLIES

To connect your RC24EM to a tar
target cable assembly, plus the ap
package. Figure 3-3 shows how c
module, and also shows how the t

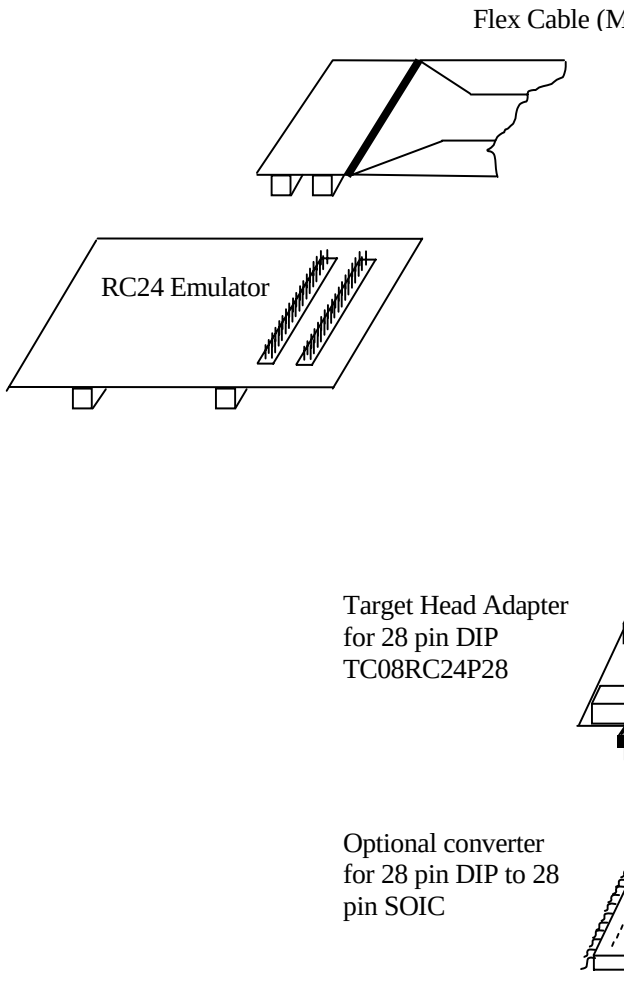

Figure 3-3.

If you install the RC24EM in the
through the slit in the station-mod

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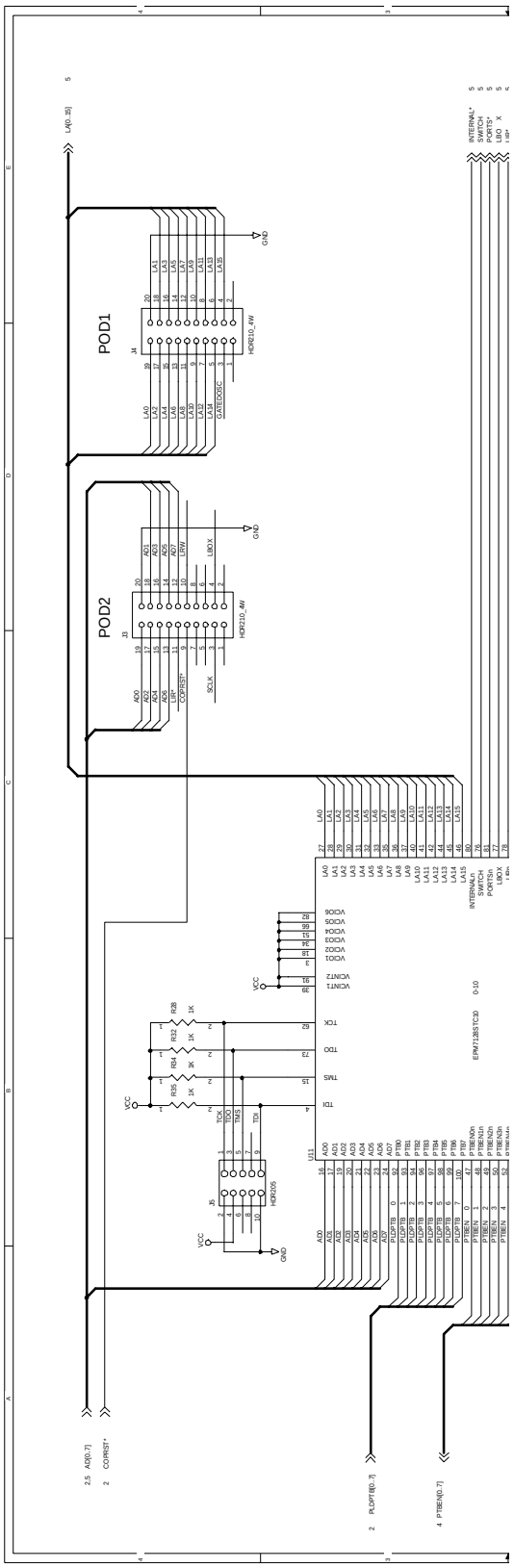

CHAP

SCHEM

This chapter consists of schematic
begin on the next page of this ma

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5	PFB	SOCKETS
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REVISIONS

REV	DESCRIPTIO N	DAT E	REVISE D BY
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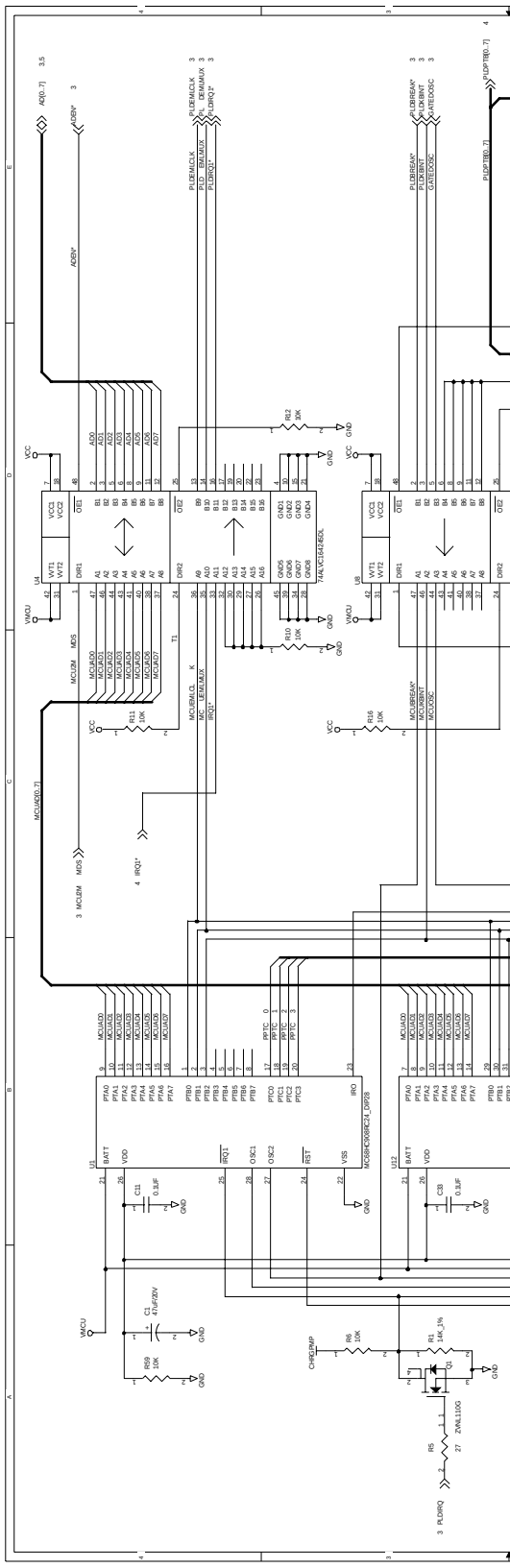
A	PRODUCTION REL EASE	03/15/ 99	BBC



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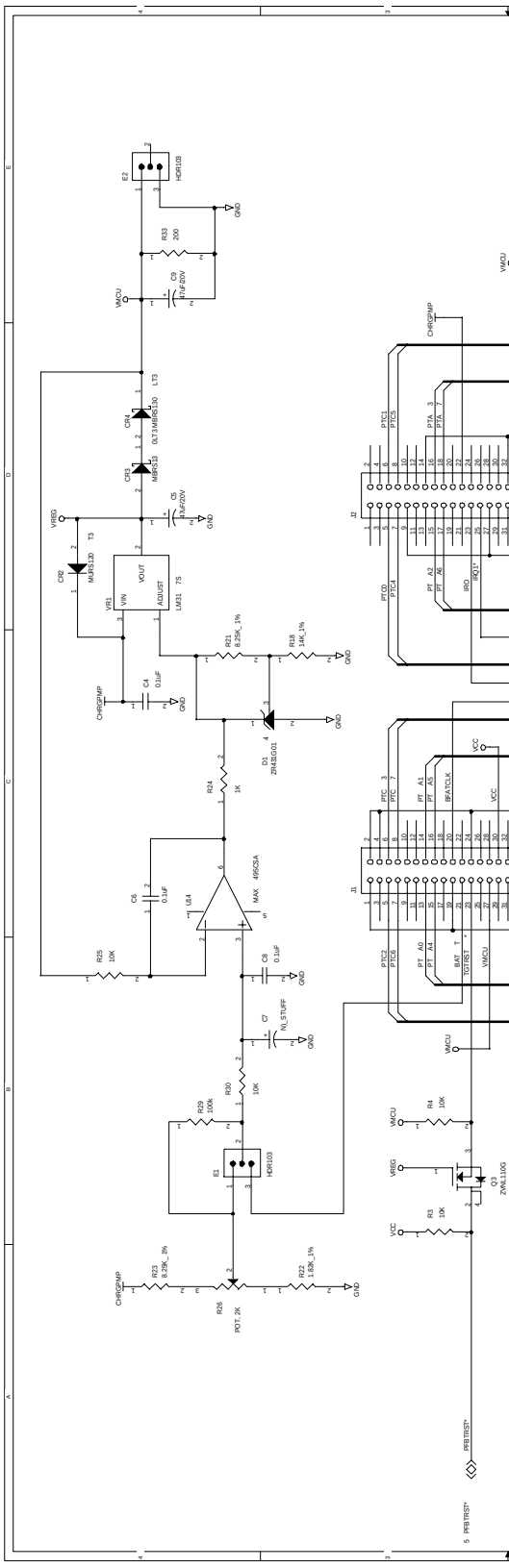

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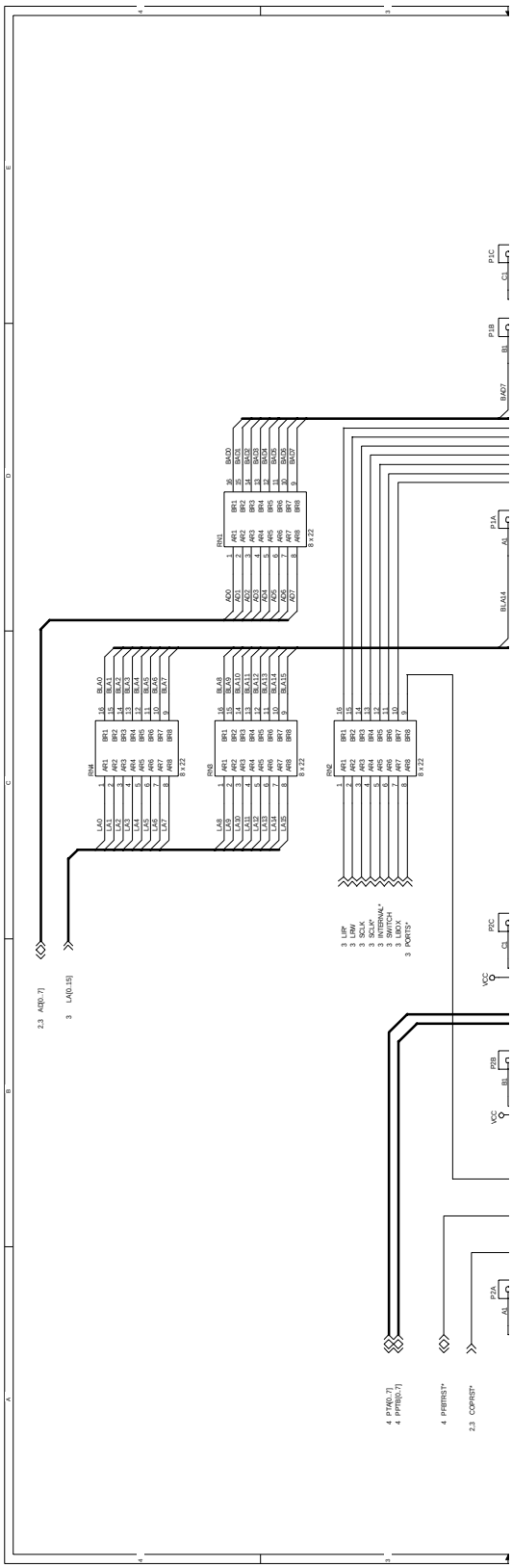

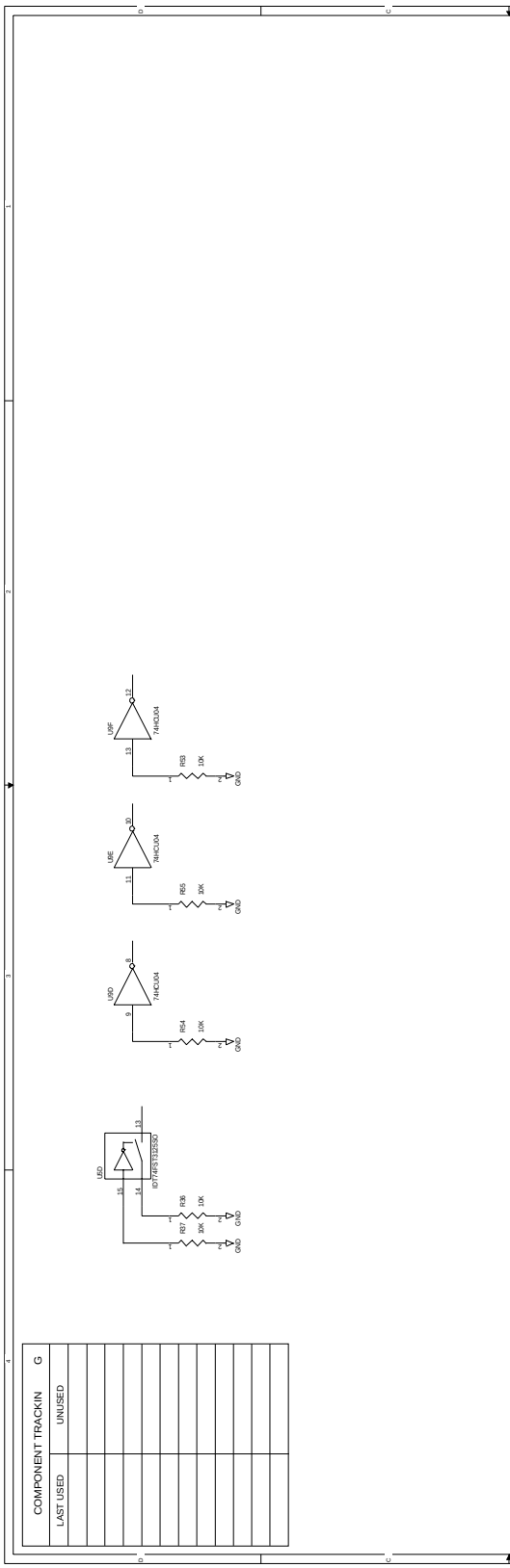

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